phenomena journal

Scoping Review

Brain tumor aphasia: the role of speech therapy

Federica Ascione

Phenomena Hub, Torre Annunziata, Italy

ABSTRACT

Objective: The term "aphasia" refers to an acquired language disorder resulting from damage to brain structures involved in the processing of various aspects of linguistic competence. It manifests as a partial or total loss of the complex processes of language comprehension and production, due to focal brain damage affecting a wide network of cortical and subcortical structures in the language-dominant hemisphere, which is left in most individuals.

Among the different etiologies, brain tumors represent a cause of particular clinical relevance, both for the progressive characteristics of the underlying pathology and for the associated rehabilitation implications.

This work aims to systematically analyze the available scientific literature on brain tumor–related aphasia, with particular attention to the role of speech therapy, in order to provide a clear and structured overview of the current state of knowledge.

Methods: The review was conducted following the PRISMA-ScR guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) to ensure methodological transparency and reproducibility. The bibliographic search was performed on the PubMed database using a search string combining the keywords "Aphasia" and "Brain Neoplasms," with predefined inclusion criteria.

Results: Three studies, all case reports, were included. They describe heterogeneous aphasic patterns, related to the tumor's nature, location, and progression, as well as the effects of surgical and oncological treatments. In all cases, speech therapy played a central role through direct rehabilitation interventions, compensatory strategies, long-term monitoring, and support for neuroplasticity, particularly in pediatric patients.

Conclusions: Despite the limited number of available studies, the evidence suggests that speech therapy is a crucial component in the management of patients with brain tumor–related aphasia. Rehabilitation should be personalized, multimodal, and integrated throughout the clinical pathway. However, current literature highlights a significant lack of systematic studies on this topic; future research with larger samples, standardized protocols, and longitudinal follow-ups is therefore needed to establish more robust rehabilitation approaches.

Keywords

Aphasia, Brain neoplasm, Speech therapy.

Citation: Ascione, F. Aphasia in brain tumor patients: the role of speech therapy. *Phenomena Journal - Giornale Internazionale Di Psicopatologia, Neuroscienze E Psicoterapia,* 7(4), 152–158.

Editor in Chief: Raffaele Sperandeo, PhD, MD

Corresponding Author: Federica Ascione, MD;
e-mail: ascione.f00@gmail.com

Received: October 26, 2025

Accepted: November 27, 2025

Published: December 19, 2025

ABSTRACT in ITALIANO

Obiettivi: Il termine "afasia" si riferisce a un disturbo acquisito del linguaggio, conseguente a una lesione delle strutture cerebrali coinvolte nell'elaborazione dei diversi aspetti delle competenze linguistiche. Essa si configura come una perdita, parziale o totale, dei complessi processi di interpretazione e formulazione del linguaggio, dovuta a un danno cerebrale focale che interessa un'ampia rete di strutture corticali e sottocorticali dell'emisfero dominante per il linguaggio, che nella maggior parte degli individui è quello sinistro.

Tra le diverse eziologie, i tumori cerebrali rappresentano una causa di particolare rilevanza clinica, sia per le caratteristiche evolutive della patologia di base, sia per le implicazioni riabilitative.

Il presente lavoro si propone di analizzare in modo sistematico la letteratura scientifica disponibile in merito all'afasia da tumore cerebrale, con particolare attenzione al ruolo della logopedia, al fine di restituire un'immagine chiara e strutturata dello stato attuale delle conoscenze.

Metodi: La revisione è stata condotta seguendo le linee guida del metodo PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) per garantire trasparenza e riproducibilità metodologica. La ricerca bibliografica è stata effettuata sul database PubMed, utilizzando una stringa di ricerca che combinava le parole chiave "Afasia" e "Neoplasie cerebrali", con criteri di inclusione predefiniti.

Risultati: Sono stati inclusi tre studi, tutti case report, che descrivono quadri di afasia eterogenei, in relazione alla natura, alla localizzazione e all'evoluzione del tumore, nonché agli effetti dei trattamenti chirurgici e oncologici. In tutti i casi, la logopedia ha svolto un ruolo centrale attraverso interventi diretti di riabilitazione, strategie compensative, monitoraggio a lungo termine e supporto alla neuroplasticità, in particolare in età pediatrica.

Conclusioni: Nonostante il numero limitato di studi disponibili, le evidenze suggeriscono che l'intervento logopedico rappresenti un elemento cruciale nella presa in carico del paziente con afasia da tumore cerebrale. La riabilitazione dovrebbe essere personalizzata, multimodale e integrata lungo tutto il percorso clinico. Tuttavia, la letteratura attuale evidenzia una significativa carenza di studi sistematici su questo argomento; sono quindi necessari studi futuri con campioni più ampi, protocolli standardizzati e follow-up longitudinali per definire approcci riabilitativi maggiormente consolidati.

Parole chiave
Afasia, Tumore cerebrale, Logopedia.

"*It is impossible not to communicate.*
Action or inaction, words or silence all convey a message:
they influence others, and others, in turn, cannot avoid responding
to these communications and thus, communicating themselves".

P. Watzlavic

INTRODUCTION

Imagine that suddenly everyone around you, from your loved ones to strangers, speaks an unknown language. You do not understand what they are saying, and you cannot express what you want to say.

Imagine no longer being able to read your usual newspaper or favorite magazine.

Imagine no longer being able to write a shopping list or a love note.

And again, imagine that you can no longer see well; that you can no longer move your arm or leg freely.

Only gradually do you realize that you have changed. You don't know it yet, but you have become aphasic [1].

Aphasia is an acquired language disorder resulting from damage to brain structures involved in language processing. It involves a partial or total loss of the ability to understand and/or produce language, due to focal damage to a complex network of cortical and subcortical structures, mainly located in the left hemisphere, which is dominant for language in most individuals [2].

Aphasia disorders can affect all levels of linguistic competence – phonological, morphological, syntactic, semantic-lexical, and pragmatic – and manifest themselves in both production and comprehension, in both oral and written form [2].

The most common causes of aphasia include ischemic or hemorrhagic strokes, head trauma, and brain tumors [2]. In particular, aphasia caused by brain tumors is a clinical condition of growing interest, both because of the progressive nature of the clinical picture and because of the challenges it poses in terms of diagnosis and rehabilitation.

Unlike acute-onset aphasia, aphasia caused by neoplasms can have a slower and more insidious progression. Clinical expression is influenced by multiple factors, including the location of the lesion, the nature of the tumor (benign or malignant), the rate of growth, and any complications arising from cancer treatments such as surgery, radiation therapy, or chemotherapy [3].

In this context, speech therapy plays a central role in the process of assessing and treating language deficits, as speech therapy aims not only at the functional recovery of impaired abilities but also at promoting compensatory strategies and improving the patient's quality of life.

This study aims to conduct a scoping review of the available scientific literature on brain tumor aphasia, with a particular focus on the role of speech therapy in this field. The objective is to map and synthesize existing evidence, providing an up-to-date, critical, and structured overview of the current state of knowledge to identify gaps and guide future research.

MATERIALS AND METHODS

The research was conducted following the PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) guidelines [4] to ensure a transparent, systematic, and reproducible methodology for the identification and selection of scientific literature.

Table 1. Search strategy.

("Aphasia"[Mesh]) AND "Brain Neoplasms"[Mesh]

Specifically, the bibliographic search was carried out on the PubMed database, using a search string that combined the keywords "Aphasia" and "Brain Neoplasms" (Table 1).

For eligibility purposes, articles published up to 2025, in English, investigating the role of speech therapy in cases of brain tumor aphasia were considered. In addition, the various study designs included: case reports, clinical studies, clinical trials, comparative studies, controlled clinical trials, and observational studies (Table 2).

Initially, 120 articles were identified in the PubMed database. Following the inclusion criteria (Table 2), based on titles and abstracts, a total of 113 articles were excluded. Furthermore, after reading the full text, four articles were excluded. The remaining 3 articles were included in the Scoping Review, as they met the inclusion criteria (Figure 1).

The protocol for this scoping review was defined a priori in order to ensure methodological transparency and scientific rigor.

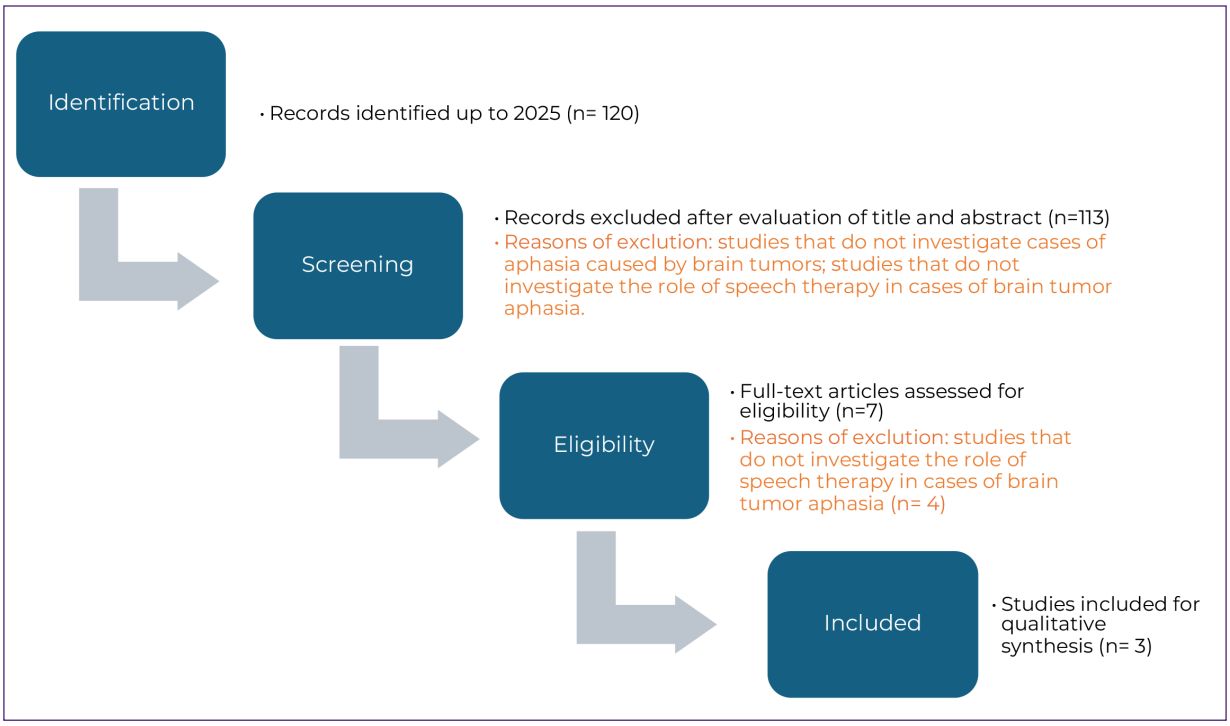

Figure 1. Flow chart of the article selection process.

Table 2. **Eligibility criteria.**

Inclusion criteria	- English language - Studies published up to 2025 - Study designs: clinical case, clinical study, clinical trial, comparative study, controlled clinical trial, observational study - Studies investigating the role of speech therapy in cases of aphasia caused by brain tumors
Exclusion criteria	- Studies that do not investigate cases of aphasia caused by brain tumors - Studies that do not investigate the role of speech therapy in cases of aphasia caused by brain tumors

Although not formally registered in databases such as PROSPERO or Open Science Framework, the review was conducted following the model proposed by the PRISMA extension for Scoping Reviews (PRISMA-ScR), published in 2019. This framework includes 20 mandatory criteria (plus 2 optional ones) that guide researchers in the design, description, and framing of their work within the category of scoping reviews. In accordance with this model, the objectives of the review, the eligibility criteria, the databases to be consulted, and the main categories for data extraction and synthesis were defined in advance.

The selection of studies was conducted independently by the author, based on previously defined eligibility criteria. When doubts arose about the inclusion of specific studies, a discussion with the academic supervisor was held to reach a shared decision. This procedure contributed to minimizing the risk of bias during the study selection process.

RESULTS

The characteristics of the selected studies have been summarized in Table 3, which provides information on the author, title, year of publication, study design, sample, cause and type of aphasia, and main results.

Overall, three studies that met the predefined inclusion criteria were included. All three selected articles are clinical case studies describing patients with aphasia resulting from brain tumors who were treated or followed up with a speech therapy approach. The results are heterogeneous in terms of age, tumor location, clinical manifestations, and rehabilitation strategies adopted, but they offer relevant insights into the role of speech therapy in the management of aphasia in this specific clinical context.

Study 1 (Pogson & Halmagyi) [5]

In this study, the authors describe the case of a 57-year-old man with inoperable gastroesophageal adenocarcinoma, treated with chemotherapy and radiotherapy. The patient presented with verbal deafness, characterized by a selective inability to understand verbal language, despite normal perception of pure tones and the ability to recognize voices, environmental sounds, and musical instruments.

An MRI scan revealed a metastatic brain lesion, which was subsequently treated with stereotactic radiotherapy. The rehabilitation team, including speech therapists, introduced the use of a voice-to-text translator on a smartphone as a compensatory strategy to facilitate communication with the family.

Three months later, the MRI showed a reduction in the mass, and language comprehension was restored. This case highlights how language comprehension can be impaired despite normal auditory function and shows how technological solutions, when integrated into a rehabilitation program, can support communication in patients with aphasia [5].

Study 2 (Satoer et al.) [6]

Satoer and colleagues describe the case of a patient (KO) with recurrent glioma in the left hemisphere, located anteriorly and laterally to the supplementary motor area. The patient underwent awake craniotomy, pre-

Table 3. Summary of selected articles.

Author, Year	Title	Study design	Sample size	Cause of aphasia	Type of aphasia	Main Findings
Pogson and Halmagyi, 2022 [5]	Hearing but not understanding: word deafness from a brainstem lesion	Case report	A 57-year-old man, with a history of inoperable adenocarcinoma.	Metastatic brain lesion compressing both inferior colliculi.	Word deafness, in which there is a specific inability to understand speech, despite intact hearing of pure tones.	Language comprehension may be compromised, even though hearing is normal. In such cases, technological devices can support communication.
Satoer et al, 2013 [6]	Dynamic aphasia following low-grade glioma surgery near the supplementary motor area: A selective spontaneous speech deficit	Case report	A patient (KO) with slight pre-morbid reduced spontaneous speech.	Recurrent left hemispheric glioma anterior and lateral to the supplementary motor area in the left frontal lobe, treated with awake craniotomy.	Pure dynamic aphasia, in which spontaneous speech is reduced, whereas naming, repetition and comprehension are intact. Also, there is an impairment of verbal fluency and there are executive disorders.	Resection in the fronto-medial lobe, in conjunction with slight pre-morbid difficulties in the spontaneous speech could increase the risk of cognitive disturbances at long term, especially language.
Peru et al, 2007 [7]	Suggestive Evidence for an Involvement of the Right Hemisphere in the Recovery from Childhood Aphasia: A 3-Year Follow-Up Case Study	Case report	A 11-year-old girl, previously healthy, right-handed girl with acquired childhood aphasia.	A cerebral hemorrhage into a left hemispheric brain tumor.	Moderately severe nonfluent aphasia with a good recovery of comprehensive components but persisting severe impairment in expressive language.	After a 3-year follow-up period, all tests demonstrated a clear left fiel/left ear right hemisphere advantage in many different language tasks. So, the right hemisphere plays a functional role in the reorganization of language after brain lesions.

ceded and followed by a series of neuropsychological and linguistic assessments up to one year post-surgery.

KO already had mild difficulties with spontaneous speech prior to surgery. After surgery, he presented with a picture consistent with pure dynamic aphasia: reduced spontaneous speech with preserved naming, repetition, and comprehension. In addition, deficits in verbal fluency and impaired executive functions were observed.

The study highlights the potential impact of resections in the left medial frontal lobe on long-term linguistic and cognitive functions and suggests the importance of prolonged speech therapy monitoring, especially in the presence of premorbid difficulties [6].

Study 3 (Peru et al.) [7]

The third study presents the case of an 11-year-old girl, right-handed and previously healthy, who developed acquired aphasia following a cerebral hemorrhage associated with a tumor in the left hemisphere.

During a three-year follow-up, a progressive recovery of comprehension skills was observed, while expressive language remained severely impaired. The patient continued to exhibit moderate to severe non-fluent aphasia. An experimental investigation revealed a functional advantage of the right hemisphere (left visual and auditory field) in various linguistic tasks, suggesting a process of neural restructuring.

This case confirms the importance of childhood brain plasticity in post-lesion recovery and highlights the crucial role of speech therapy in supporting language development by exploiting hemispheric compensation mechanisms [7].

DISCUSSION

This review highlights how aphasia caused by brain tumors represents a complex, variable clinical condition that has yet to be thoroughly investigated in the literature. Although the three cases selected are heterogeneous in terms of age, etiology, and aphasic manifestations, they offer significant insights into the role of speech therapy in the management of these patients.

The first element that emerged is the clinical variability of aphasic manifestations associated with brain tumors. The cases described include verbal deafness, dynamic aphasia, and non-fluent aphasia, confirming that neoplasms can selectively compromise linguistic components depending on the location, extent, and progression of the lesion. This implies the need for in-depth and individualized linguistic assessments conducted by experienced professionals, such as speech-language pathologists.

From a rehabilitation perspective, the importance of multimodal and adaptive approaches emerges. For example, in the case described by Pogson and Halmagyi [5], the introduction of technological support (voice-to-text translator) was a valuable temporary compensatory tool to facilitate the patient's communication. This highlights the role of the speech-language pathologist not only in the direct rehabilitation of linguistic functions, but also in the functional management of everyday communication through alternative strategies.

The case described by Satoer et al [6] highlights the importance of pre- and post-operative assessment, especially in patients undergoing tumor resection of brain areas involved in language. Speech therapy can contribute significantly to monitoring language development, preventing deficits, and planning targeted interventions based on individual neuropsychological profiles.

Finally, the pediatric case reported by Peru et al [7] draws attention to childhood neuroplasticity and potential hemispheric reorganization, particularly of the right hemisphere, following early lesions. In these cases, speech therapy plays a crucial role not only in language recovery but also in supporting communicative and academic development, with long-term interventions adapted to the developmental age.

Limitations

This review presents several limitations that should be acknowledged. The search was conducted using a single database (PubMed), which may have limited the breadth and comprehensiveness of the studies retrieved. Furthermore, the entire study selection and analysis process was carried out independently by the author, with input from the academic supervisor in cases of uncertainty, potentially introducing subjective bias. Another significant limitation is the small number of included studies (n=3), all of which were case re-

ports—a type of evidence that is methodologically limited and offers low generalizability. These factors reduce the possibility of drawing broad conclusions, although they provide useful insights for future research on a larger scale.

CONCLUSIONS

Despite the limitations arising from the small number of studies currently available, the data emerging from this review suggest that speech therapy intervention in cases of brain tumor aphasia is a crucial element throughout the entire clinical pathway. In particular, the rehabilitation approach should:

- be present from the early stages, continuing through follow-up, adapting to changes in the clinical picture;
- be tailored to the linguistic and cognitive profile and specific communication needs of each patient;
- integrate technological tools (e.g., voice translation apps, augmentative and alternative communication) and compensatory strategies to promote effective communication in daily life;
- play a central role, especially in childhood, when greater brain plasticity can promote recovery, provided that intervention is early, intensive, and continuous.

Furthermore, the importance of the active presence of speech-language pathologists within multidisciplinary teams involved in the care of patients with brain tumors is reiterated. An integrated, person-centered approach that considers not only the clinical management of the disease but also the maintenance of communication skills and quality of life is a fundamental goal of contemporary rehabilitation.

However, current literature highlights a significant lack of systematic studies on this topic. Therefore, further research with larger samples, longitudinal follow-ups, and standardized assessment protocols is needed to verify the effectiveness of speech therapy interventions in this specific context.

Funding

This research received no external funding.

Conflict of Interest

The author declares no conflict of interest.

Data Availability

All data supporting the findings of this study are available within the article.

BIBLIOGRAPHY

1. Basso, A. (Ed.). (n.d.). *L'afasia, la persona afasica, la riabilitazione*. A.IT.A. Federazione. Available at: https://www.aitafederazione.it/aita/wp-content/uploads/2017/10/libretto_AFASIA.pdf [Accessed on: September 2025].
2. Federazione Logopedisti Italiani. (2009). *Linee guida sulla gestione logopedica del paziente afasico adulto* (1st ed.). Istituto Superiore di Sanità. Available at: https://www.fli.it/linee-guida [Accessed on: September 2025].
3. Associazione Italiana Malati di Cancro (AIMaC). (2015). *I tumori cerebrali* (4th ed.). AIMaC. Available at: https://www.aimac.it/libretti-tumori/tumore-cervello [Accessed on: September 2025].
4. Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., ... & Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of internal medicine*, 169(7), 467-473.
5. Pogson, J., & Halmagyi, G. M. (2022, February). Hearing but not understanding: Word deafness from a brainstem lesion. *The Lancet*, *399*(10324), 616.
6. Satoer, D., Kloet, A., Vincent, A., Dirven, C., & Visch-Brink, E. (2014). Dynamic aphasia following low-grade glioma surgery near the supplementary motor area: a selective spontaneous speech deficit. *Neurocase, 20*(6), 704-716.
7. Peru, A., Moro, V., Tellini, P., & Tassinari, G. (2006). Suggestive evidence for an involvement of the right hemisphere in the recovery from childhood aphasia: A 3-year follow-up case study. *Neurocase, 12*(3), 179-190.